

**Translation**

PATENT COOPERATION TREATY

**PCT**

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference WO26218	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/00395	International filing date (day/month/year) 19 January 2000 (19.01.00)	Priority date (day/month/year) 31 March 1999 (31.03.99)
International Patent Classification (IPC) or national classification and IPC G01R 15/20		
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<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>8</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>2</u> sheets.</p>	
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input checked="" type="checkbox"/> Certain defects in the international application</p> <p>VIII <input checked="" type="checkbox"/> Certain observations on the international application</p>	

Date of submission of the demand 11 September 2000 (11.09.00)	Date of completion of this report 03 July 2001 (03.07.2001)
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# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP00/00395

## I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

- ☒ the international application as originally filed.
- ☐ the description, pages 1-11, as originally filed,  
 pages \_\_\_\_\_, filed with the demand,  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☐ the claims, Nos. \_\_\_\_\_, as originally filed,  
 Nos. \_\_\_\_\_, as amended under Article 19,  
 Nos. \_\_\_\_\_, filed with the demand,  
 Nos. 1-5, filed with the letter of 28 May 2001 (28.05.2001),  
 Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☐ the drawings, sheets/fig 1/3-3/3, as originally filed,  
 sheets/fig \_\_\_\_\_, filed with the demand,  
 sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	5-7, 10, 11 (original formulation)	<b>YES</b>
	Claims	1-4, 8, 9 (original formulation)	<b>NO</b>
Inventive step (IS)	Claims		<b>YES</b>
	Claims	5-7, 10, 11 (original formulation)	<b>NO</b>
Industrial applicability (IA)	Claims	1-11 (original formulation)	<b>YES</b>
	Claims		<b>NO</b>

**2. Citations and explanations****a) Novelty:**

i. D1: WO-A-96/28738,

in particular the abstract; page 2, antepenultimate paragraph - page 3, paragraph 2; page 3, antepenultimate line - page 4, line 4; pages 5 and 6; Claims 1-4 and 6-17,

discloses all the technical features of Claims 1, 2, 4, 8 and 9 as filed.

ii. Further, D2: Patent Abstracts of Japan, vol. 6, no. 225 (P-154), 10 November 1982 & JP-A-57 128 854

discloses all the technical features of Claims 1 and 3 as filed.

Therefore, Claims 1-4, 8 and 9 as filed are inconsistent with PCT Article 33(2).

**b) Inventive step:**

Insofar as Claims 5-7, 10 and 11 as filed can be examined, they contain technical features that do not involve an

inventive step.

Specifically:

i. The shielding mentioned in Claim 5 as filed is routinely employed as required in the field of magnetic sensors.

ii. It is generally known that, in a power supply network, conductors are of either rectangular (e.g. in current multi-terminal busbars) or round (e.g. overhead lines or cables) section (cf. also in this connection D1, in particular the paragraph starting at the bottom of page 3, where such a conductor is explicitly indicated in a power supply network). Since it is also generally known that, for geometric reasons, the magnetic field that forms about a round conductor is more uniform than that about an angular conductor, a person skilled in the art will, where possible, prefer a round conductor to an angular conductor as a measuring point (as claimed in Claim 6 as filed).

iii. Locating Hall-effect sensors as close to each other spatially as possible (cf. Claim 7 as filed) (in order to ensure that, as far as possible, each sensor is exposed to the same field) represents an obvious technical measure in the present specialized area.

iv. Claim 10 as filed:

Where a large number of sensors is used (cf. e.g. D1, in particular Claims 1, 8 and 11), it is normal expert practice to combine the signals so as to ensure the intended multiplication of the desired signals and elimination of the undesired signals by addition and subtraction, respectively.

v. Claim 11 as filed:

Hall-effect sensors are generally known to be temperature-sensitive. A person skilled in the art will therefore, as required, apply one of the many known and routinely employed temperature-compensating procedures, without thereby being inventive.

Therefore, Claims 5-7, 10 and 11 as filed are inconsistent with PCT Article 33(3).

**I. Basis of the report**

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

Continuation of: Box I.5

a) Contrary to the relevant statements in the petition dated 28 May 2001, the application as filed does not disclose the following technical features, either in the places specifically cited or elsewhere:

i. four Hall-effect sensors, wherein each pair of opposed Hall-effect sensors is so arranged as to detect a...magnetic field... having the same sign in each case; cf. the present revised Claim 1;

ii. in each case opposed pairs of Hall-effect sensors and an evaluation circuit designed to add the output signal of a pair of opposed sensors; cf. the present revised Claim 2.

b) i. Revised Claims 1 and 2 are therefore inconsistent with PCT Article 34(2)(b).

ii. Therefore, these two revised independent claims, which are directed towards originally undisclosed subjects, cannot be examined for the presence of novelty, inventive step and industrial applicability and resort has been had for this purpose to the claims as filed.

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

The present description contains the following unclear passages:

- a) On page 5, lines 20-25, the misleading impression is created that the magnetic field itself is strengthened.
- b) On page 7, paragraphs 1 and 2, the Hall-effect sensors should have been provided with the same reference signs applied elsewhere in the application.
- c) On page 8, line 21, there is a typing error.
- d) Page 11, lines 30-33, contains the misleading statement: "the measured value of the current (is) strengthened".
- e) The current wording of the description does not take into account the reformulation of the claims.

## VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- a) Claims 1-11 **as filed**, which form the basis of Box V of this report, contain the following unclear and/or inconsistent passages (see PCT Article 6):
- i. In general, it should be noted that, in each of device Claims 2, 3 and 9, process steps instead of the appropriate device features are listed (see e.g. in Claim 2 alone: "wherein...the...signals...are subtracted from each other"). This is especially pertinent in that the application as a whole does not indicate clearly whether the "evaluation circuit" should be considered a constituent part of the current measuring sensor (cf. e.g. Figures 2 and 3, which show "the current measuring sensor" as per the corresponding description and the text on pages 8, paragraph 3, where said "evaluation circuit" is described as being for a current measuring sensor).
- ii. Claims 1 and 2 contain the statement: "with at least two...Hall-effect sensors...(which)...detect the...field having in each case a different sign". Since the expression "at least two" may also mean "more than two", while only two different polarities are possible, this statement is unclear (this also applies *mutatis mutandis* to the content of the last paragraph on page 11 of the description).
- iii. In Claim 5 the statement "shielding...(is) applied about the Hall-effect sensors" is unclear *per se*.
- iv. Since the conductor as such is not a constituent of the current measuring sensor, the latter cannot be limited (and thus cannot be more precisely defined) by the



## VIII. Certain observations on the international application

additional features in Claim 6, which pertain exclusively to said conductor.

v. Claims 9 and 10 contain the grammatical inconsistency: "wherein a large number of...pairs...are provided".

b) For the sake of completeness, the applicant's attention is drawn to the following inconsistencies with PCT Article 6 in **revised** Claims 1-5:

i. Independent Claims 1 and 2:

The present wording

- does not make clear in relation to what the Hall-effect sensors are "equidistantly" arranged (to each other or the conductor);

- with respect to the reference sign "(2)" used for the "conductor", does not take into account the contents of Figures 4 and 5, upon which (as per the petition dated 28 May 2001) the subject matter of revised Claims 1 and 2 is based.

ii. Since Claims 5 and 6 as filed have been retained essentially unaltered as revised Claims 3 and 4, respectively, the comments in Box VIII, a) iii and iv of this report also apply, respectively, to them.